

OHS13650

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SECTION 1           CHEMICAL PRODUCT AND COMPANY IDENTIFICATION  
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SUBSTANCE: MANGANESE SULFATE

## TRADE NAMES/SYNONYMS:

MANGANESE(2+) SULFATE; MANGANESE SULPHATE; MANGANOUS SULFATE; MAN-GRO;  
SORBRA-SPRAY MN; SULFURIC ACID, MANGANESE(II) SALT; SULFURIC ACID,  
MANGANESE(2+) SALT (1:1); MANGANESE MONOSULFATE; MANGANESE(II) SULFATE;  
MANGANESE(II) SULPHATE; MANGANESE SULFATE (1:1); MANGANESE SULFATE (MnSO4);  
MANGANESE(2+) SULFATE (1:1); MANGANESE(2+) SULFATE (MnSO4); SULFURIC ACID,  
MANGANESE(2+) SALT; OHS13650; RTECS OP1050000

CHEMICAL FAMILY: inorganic, salt

CREATION DATE: Jun 18 1985  
REVISION DATE: Mar 18 2002

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SECTION 2           COMPOSITION, INFORMATION ON INGREDIENTS  
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COMPONENT: MANGANESE SULFATE  
CAS NUMBER: 7785-87-7  
EC NUMBER (EINECS): 232-089-9  
EC INDEX NUMBER: 025-003-00-4  
PERCENTAGE: 100

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SECTION 3           HAZARDS IDENTIFICATION  
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NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=0 REACTIVITY=0

## EMERGENCY OVERVIEW:

COLOR: red

PHYSICAL FORM: crystals

MAJOR HEALTH HAZARDS: No significant target effects reported.

POTENTIAL HEALTH EFFECTS:

## INHALATION:

SHORT TERM EXPOSURE: no information is available

LONG TERM EXPOSURE: headache, difficulty speaking, sleep disturbances, mood swings, loss of coordination, hearing loss, visual disturbances, impotence, lung damage, blood disorders, kidney damage, liver damage, nerve damage

## SKIN CONTACT:

SHORT TERM EXPOSURE: irritation, allergic reactions

LONG TERM EXPOSURE: allergic reactions

## EYE CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: irritation

## INGESTION:

SHORT TERM EXPOSURE: gastrointestinal irritation, nausea, vomiting, diarrhea

LONG TERM EXPOSURE: same as effects reported in long term inhalation

## CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

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SECTION 4 FIRST AID MEASURES  
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INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

ANTIDOTE: calcium disodium edetate/dextrose, intravenous; calcium disodium edetate/procaine, intramuscular.

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SECTION 5 FIRE FIGHTING MEASURES  
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FIRE AND EXPLOSION HAZARDS: Negligible fire hazard.

EXTINGUISHING MEDIA: Use extinguishing agents appropriate for surrounding fire.

FIRE FIGHTING: Move container from fire area if it can be done without risk.

Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

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## SECTION 6 ACCIDENTAL RELEASE MEASURES

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### OCCUPATIONAL RELEASE:

Collect spilled material in appropriate container for disposal.

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## SECTION 7 HANDLING AND STORAGE

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STORAGE: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

HANDLING: Use methods to minimize dust.

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## SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

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### EXPOSURE LIMITS:

#### MANGANESE SULFATE:

##### MANGANESE COMPOUNDS (as Mn):

5 mg/m<sup>3</sup> OSHA ceiling

0.2 mg/m<sup>3</sup> ACGIH TWA (inorganic compounds)

1 mg/m<sup>3</sup> NIOSH recommended TWA 10 hour(s)

3 mg/m<sup>3</sup> NIOSH recommended STEL

0.5 mg/m<sup>3</sup> DFG MAK (inhalable dust fraction) (peak limitation category-III)  
(inorganic compounds)

5 mg/m<sup>3</sup> UK OES TWA

MEASUREMENT METHOD: Particulate filter; Acid; Inductively coupled plasma;  
NIOSH IV # 7300, Elements

VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn

from NIOSH and/or OSHA.

Measurement Element:

Manganese (Mn)

10 mg/m3

Any dust and mist respirator except single-use and quarter-mask respirators.

Any supplied-air respirator.

25 mg/m3

Any supplied-air respirator operated in a continuous-flow mode.

Any powered, air-purifying respirator with a dust and mist filter.

50 mg/m3

Any air-purifying respirator with a full facepiece and a high-efficiency particulate filter.

Any supplied-air respirator with a tight-fitting facepiece that is operated in a continuous-flow mode.

Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter.

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

500 mg/m3

Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode.

Escape -

Any air-purifying respirator with a full facepiece and a high-efficiency particulate filter.

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

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## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

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PHYSICAL STATE: solid

APPEARANCE: efflorescent

COLOR: red

PHYSICAL FORM: crystals

ODOR: Not available

MOLECULAR FORMULA: Mn-O4-S

BOILING POINT: Not applicable

MELTING POINT: 1292 F (700 C)

DECOMPOSITION POINT: 1562 F (850 C)

VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable

SPECIFIC GRAVITY (water=1): 3.3

WATER SOLUBILITY: 52% @ 5 C

PH: Not applicable  
VOLATILITY: Not applicable  
ODOR THRESHOLD: Not available  
EVAPORATION RATE: Not applicable  
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available  
SOLVENT SOLUBILITY:  
Soluble: alcohol  
Insoluble: ether

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## SECTION 10 STABILITY AND REACTIVITY

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REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: None reported.

INCOMPATIBILITIES: No data available.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: oxides of sulfur

POLYMERIZATION: Will not polymerize.

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## SECTION 11 TOXICOLOGICAL INFORMATION

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MANGANESE SULFATE:

TOXICITY DATA:

2150 mg/kg oral-rat LD50; 92600 ug/kg intraperitoneal-rat LD50; 44100 ug/kg intravenous-rat LD50; 2330 mg/kg oral-mouse LD50; 147 mg/kg intraperitoneal-mouse LD50; >31600 ug/kg intravenous-mouse LD; 1400 mg/kg/14 day(s) intermittent oral-rat TDLo; 9 gm/kg/90 day(s) intermittent oral-rat TDLo; 150 mg/kg/10 day(s) intermittent intraperitoneal-rat TDLo

ACUTE TOXICITY LEVEL:

Moderately Toxic: ingestion

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: history of alcoholism, blood system disorders, liver disorders, nervous system disorders, respiratory disorders

TUMORIGENIC DATA:

660 mg/kg intraperitoneal-mouse TDLo/8 week(s) intermittent

MUTAGENIC DATA:

mutation in microorganisms - Salmonella typhimurium 1775 nmol/tube (+S9); DNA repair - Bacillus subtilis 50 mmol/L; mutation in microorganisms - other microorganisms 10 mmol/L (-S9); DNA inhibition - Saccharomyes cerevisiae 10 mmol/L; sex chromosone loss and non disjunction - Saccharomyes cerevisiae 3 mmol/L

REPRODUCTIVE EFFECTS DATA:

15 gm/kg oral-mouse TDLo 6 week(s) pre pregnancy/1-3 week(s) pregnant female/3 week(s) post pregnancy continuous; 34356 ug/kg intraperitoneal-mouse TDLo 10 day(s) pregnant female continuous; 68711 ug/kg intraperitoneal-mouse TDLo 8 day(s) pregnant female continuous

#### HEALTH EFFECTS:

##### INHALATION:

MANGANESE SULFATE: See information on manganese compounds.

##### ACUTE EXPOSURE:

MANGANESE COMPOUNDS: No data available.

##### CHRONIC EXPOSURE:

MANGANESE COMPOUNDS: Repeated or prolonged exposure to manganese compounds may result in systemic poisoning known as "manganism", a Parkinsonian-like syndrome. It is characterized initially by anorexia, asthenia, headache, insomnia or somnolence, irritability, restlessness, and spasm or pain in the muscles. Manganese psychosis may follow with uncontrollable behavior, unaccountable laughing or crying, visual hallucinations, confusion and euphoria. Sexual excitement followed by impotence may occur. These symptoms may disappear with the onset of true neurological manifestations of slow, slurred and irregular speech, monotonous tone, double vision, impaired hearing, difficulty with fine motor movements, and disturbances in gait and balance with frequent propulsion or retropulsion. Mask-like face, decreased movement of the eyelids and eyes and tremors of the upper extremities and head may also occur. Other signs and symptoms may include urinary bladder disturbances, excessive salivation and sweating, hematological changes, vasomotor disorders, decreased pulmonary function, kidney and possibly liver damage. Removal from exposure shortly after onset of symptoms usually results in improvement, although there may be residual disturbances in gait and speech. Once manganism is well established it becomes irreversible and progressive, but not fatal. An increased incidence of bronchitis and pneumonitis has been reported in studies of workers exposed to manganese dust and fume, and although these effects have been confirmed by animal experiments, they may represent an aggravation of a pre-existing condition. Allergic diseases of the respiratory tract have also been reported in one study.

##### SKIN CONTACT:

MANGANESE SULFATE: See information on manganese compounds.

##### ACUTE EXPOSURE:

MANGANESE COMPOUNDS: Some manganese compounds may be irritating to the skin.

##### CHRONIC EXPOSURE:

MANGANESE COMPOUNDS: Sensitization has been reported in guinea pigs.

## EYE CONTACT:

MANGANESE SULFATE: May cause redness and irritation. Repeated or prolonged contact may cause irritation and conjunctivitis. See information on manganese compounds.

## ACUTE EXPOSURE:

MANGANESE COMPOUNDS: Direct contact with manganese compounds may cause irritation.

## CHRONIC EXPOSURE:

MANGANESE COMPOUNDS: No data available.

## INGESTION:

MANGANESE SULFATE: See information on manganese compounds.

## ACUTE EXPOSURE:

MANGANESE COMPOUNDS: Ingestion of extremely large doses of manganese compounds may cause gastrointestinal irritation, resulting in nausea, vomiting, and diarrhea, so that less is available for absorption.

## CHRONIC EXPOSURE:

MANGANESE COMPOUNDS: Manganese poisoning, as described in chronic inhalation, has been reported in persons drinking manganese-contaminated well water.

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SECTION 12 ECOLOGICAL INFORMATION

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## ECOTOXICITY DATA:

FISH TOXICITY: 33800 ug/L 96 hour(s) LC50 (Mortality) Fathead minnow  
(Pimephales promelas)

INVERTEBRATE TOXICITY: 8280 ug/L 48 hour(s) EC50 (Immobilization) Water flea  
(Daphnia magna)

ALGAL TOXICITY: 53800 ug/L 96 week(s) EC50 (Growth) Diatom (Phaeodactylum  
tricornutum)

PHYTOTOXICITY: 7200-30000 ug/L 7 hour(s) (Residue) Water-hyacinth  
(Eichhornia crassipes)

## FATE AND TRANSPORT:

BIOCONCENTRATION: 30.8 ug/L 8 year(s) BCF (Residue) Polychaete (Nereis  
diversicolor) 1 ug/L

ENVIRONMENTAL SUMMARY: Moderately toxic to aquatic life.

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SECTION 13 DISPOSAL CONSIDERATIONS

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Dispose in accordance with all applicable regulations.

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SECTION 14 TRANSPORT INFORMATION

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U.S. DEPARTMENT OF TRANSPORTATION: No classification assigned.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: No classification assigned.

LAND TRANSPORT ADR/RID: No classification assigned.

AIR TRANSPORT IATA/ICAO: No classification assigned.

MARITIME TRANSPORT IMDG: No classification assigned.

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SECTION 15 REGULATORY INFORMATION

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U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):  
Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):  
Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):  
ACUTE: No  
CHRONIC: Yes  
FIRE: No  
REACTIVE: No  
SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65):  
MANGANESE COMPOUNDS (as Mn)

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65: Not regulated.



## CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

## EUROPEAN REGULATIONS:

## EC CLASSIFICATION (ASSIGNED):

Xn Harmful

N Dangerous for the Environment

EC Classification may be inconsistent with independently-researched data.

## DANGER/HAZARD SYMBOL:

Xn Harmful

N Dangerous for the Environment

## EC RISK AND SAFETY PHRASES:

R 48/20/22 Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S 2 Keep out of reach of children.

S 22 Do not breathe dust.

S 61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

## GERMAN REGULATIONS:

## WATER HAZARD CLASS (WGK):

STATE OF CLASSIFICATION: VwVwS

CLASSIFICATION UNDER HAZARD TO WATER: 1

## NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

## SECTION 16 OTHER INFORMATION

## MSDS SUMMARY OF CHANGES

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SECTION 3 HAZARDS IDENTIFICATION

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